IN THE CLAIMS

Please amend the claim as follows:

1. (Currently Amended) A wavelength-division-multiplexed optical source comprising:

a pump laser;

a first optical amplifier, operated by rear-pumping of the pump laser, for generating amplified spontaneous emission noise (ASE noise);

a first multiplexer/demultiplexer having a first input/output terminal on one side and a plurality of second input/output terminals on the other side, the first multiplexer/demultiplexer for demultiplexing signals inputted into the first input/output terminal and outputting the demultiplexed signals to the second input/output terminals, and the first multiplexer/demultiplexer for multiplexing signals inputted into the second input/output terminals and outputting the multiplexed signals to the first input/output terminal;

a plurality of mirrors, connected to the second input/output terminals in one-to-one correspondence, for inputting ~~again~~ the demultiplexed signals outputted through the second input/output terminals back to the second input/output terminals;

a circulator for transmitting signals inputted from the first optical amplifier to the first input/output terminal, ~~and~~ the circulator for outputting multiplexed signals inputted from the first input/output terminal;

a second optical amplifier, operated by rear-pumping of the pump laser, for amplifying multiplexed signals outputted from the circulator;

an optical splitter for splitting the multiplexed signals amplified by the second optical amplifier, ~~and~~ the optical splitter for outputting the split signals to the first optical amplifier ~~and~~ for external transmission, respectively; and

an external modulator for modulating the signals outputted for external transmission according to preset broadcasting signals and for outputting the modulated signals to a transmission link.

2. (Currently Amended) A wavelength-division-multiplexed optical source as claimed in claim 1, wherein the optical source further comprises a band-pass filter for outputting the multiplexed signals inputted from the circulator to the second optical amplifier, after having limited the multiplexed signals to a preset wavelength band of the wavelength-division-multiplexed optical source.

3. (Original) A wavelength-division-multiplexed optical source as claimed in claim 1, wherein the first optical amplifier amplifies signals inputted from the optical splitter and outputs the amplified signals to the circulator.

4. (Original) A wavelength-division-multiplexed optical source as claimed in claim 1 or claim 3, wherein the first optical amplifier comprises an erbium-doped fiber amplifier.

5. (Original) A wavelength-division-multiplexed optical source as claimed in claim 1, wherein the first optical amplifier comprises a semiconductor optical amplifier.

6. (Original) A wavelength-division-multiplexed optical source as claimed in claim 1, wherein the multiplexer/demultiplexer comprises a 1×N waveguide grating router (WGR).

7. (Original) A wavelength-division-multiplexed optical source as claimed in claim 1, wherein the second optical amplifier comprises an erbium-doped fiber amplifier.

8. (Original) A wavelength-division-multiplexed optical source as claimed in claim 1, wherein the second optical amplifier comprises a semiconductor optical amplifier.

9. (Original) A wavelength-division-multiplexed optical source as claimed in claim 1, wherein the external modulator comprises an $LiNbO_3$ modulator.

10. (Original) A wavelength-division-multiplexed optical source as claimed in claim 1, wherein the external modulator comprises an electro-absorption modulator.

11. (Original) A wavelength-division-multiplexed optical source as claimed in claim 1, wherein the external modulator comprises a semiconductor optical amplifier.

12. (Currently Amended) A passive optical network system including a central office, a local office, and a plurality of subscriber terminals, the central office being connected with a local office through an optical fiber and providing optical communication service to the subscriber terminals through the local office, the central office comprising:

a first wavelength-division-multiplexed (WDM) optical source ~~for~~ configured to provide~~ing~~ a downstream broadcasting service signals to the subscriber terminals;

a plurality of second WDM optical sources ~~for~~ configured to provide~~ing~~ ~~a~~ downstream data service signals to the subscriber terminals;

a plurality of optical receivers ~~for~~ configured to receive~~ing~~ upstream data service signals transmitted from the subscriber terminals and to convert~~ing~~ the received signals to electric signals;

a plurality of first wavelength division multiplexers ~~for~~ configured to

multiplex~~ing~~/demultiplex~~ing~~ upstream/downstream data service signals and configured to provide upstream/downstream data services to the subscriber terminals;

a ~~second~~ first multiplexer/demultiplexer ~~for~~ configured to multiplex~~ing~~ a plurality of downstream data service signals outputted from the first wavelength division multiplexers[[,]] and ~~for~~ configured to demultiplex~~ing~~ upstream data service signals to be transmitted to the first wavelength division multiplexers; and

a second wavelength division multiplexer ~~for~~ configured to multiplex~~ing~~ the multiplexed signals inputted from said ~~second~~ first multiplexer/demultiplexer and the ~~multiplexed~~ signals inputted from the first WDM optical source, ~~for~~ the second wavelength division multiplexer being configured to demultiplex~~ing~~ upstream data service signals inputted from the local office and to output~~ting~~ the demultiplexed upstream data service signals to said ~~second~~ first multiplexer/demultiplexer,

wherein the second wavelength division multiplexer comprises an optical amplifier, the optical amplifier being configured to amplify downstream signals outputted from said first multiplexer/demultiplexer and being configured to amplify upstream signals inputted into the second wavelength division multiplexer, and

wherein the optical amplifier is an erbium-doped fiber amplifier.

13. (Currently Amended) A passive optical network system as claimed in claim 12, wherein the first WDM optical source in the central office ~~is the wavelength division multiplexed optical source of claim 1~~ comprises:

a pump laser;

a first optical amplifier, operated by rear-pumping of the pump laser, configured to generate amplified spontaneous emission (ASE) noise;

a second multiplexer/demultiplexer having a first input/output terminal on one side and a plurality of second input/output terminals on the other side, the second multiplexer/demultiplexer being configured to demultiplex signals inputted into the first input/output terminal and output the demultiplexed signals to the second input/output terminals, and the second multiplexer/demultiplexer being configured to multiplex signals inputted into the second input/output terminals and output the multiplexed signals to the first input/output terminal;

a plurality of mirrors, connected to the second input/output terminals in one-to-one correspondence, the mirrors being configured to input the demultiplexed signals output from the second input/output terminals back to the second input/output terminals;

a circulator configured to transmit signals input from the first optical amplifier to the first input/output terminal, the circulator being configured to output multiplexed signals inputted from the first input/output terminal;

a second optical amplifier, operated by rear-pumping of the pump laser, for amplifying multiplexed signals that are output from the circulator;

an optical splitter being configured to split the multiplexed signals amplified by the second optical amplifier, the optical splitter being configured to output the split signals to the first optical amplifier for external transmission, respectively; and

an external modulator configured to modulate the signals for external transmission according to preset broadcasting signals and configured to output the modulated signals to a transmission link.

14. (Currently Amended) A passive optical network system as claimed in claim 13, wherein said ~~second~~ first multiplexer/demultiplexer is a 1×N waveguide grating router (WGR).

15. (Currently Amended) A passive optical network system as claimed in claim 13, wherein the first WDM optical source in the central office further comprises a first band-pass filter ~~for~~ configured to limit~~ing~~ the multiplexed signal inputted from the circulator to a preset wavelength band-pass of the first WDM optical source.

16. (Currently Amended) A passive optical network system as claimed in claim 15, wherein the second WDM optical source in the central office comprises a second band-pass filter ~~for~~ configured to limit~~ing~~ a band-pass of the second WDM optical source to one that differs from the band-pass of the first band-pass filter.

17. (Currently Amended) A passive optical network system as claimed in claim 16, wherein the second band-pass filter has the same band-pass as a free spectrum range (FSR) of said ~~second~~ first multiplexer/demultiplexer, said second band-pass filter ~~and has~~ having a center wavelength separated from the center wavelength of the band-pass of the first band-pass filter by more than a FSR ~~from a center wavelength of the first band-pass filter~~.

18. (Currently Amended) A passive optical network system as claimed in claim 12, wherein the first wavelength division multiplexer comprises:

a ~~third~~ first band-pass filter having the same band-pass as a preset wavelength band of the second WDM optical source; and

a ~~fourth~~ second band-pass filter having the same band-pass as a wavelength band of an upstream optical source in the subscriber terminal.

19. (Currently Amended) A passive optical network system as claimed in claim 12, wherein the second wavelength division multiplexer comprises:

a ~~fifth~~ first band-pass filter having the same band-pass as a wavelength band of WDM optical signals for upstream/downstream data services; and

a ~~sixth~~ second band-pass filter having the same band-pass as a preset wavelength band of the first WDM optical source.

20. (Currently Amended) A passive optical network system as claimed in claim 12, wherein said ~~second~~ first multiplexer/demultiplexer is a 1×N waveguide grating router (WGR).

21-22. (Canceled)

23. (Currently Amended) A passive optical network system as claimed in claim 12 ~~including a central office, a local office, and a plurality of subscriber terminals, the local office being connected to the central office and the subscriber terminals through optical fibers and providing optical communication service to the subscriber terminals~~, the local office comprising a second multiplexer/demultiplexer ~~for~~ configured to demultiplex~~ing~~ downstream data service optical signals ~~for downstream data service~~ and downstream broadcasting service optical signals ~~for downstream broadcasting service~~ multiplexed and transmitted from the central office ~~100~~, and ~~for~~ configured to multiplex~~ing~~ upstream optical signals transmitted from the subscriber terminals.

24. (Currently Amended) A passive optical network system as claimed in claim 23, wherein the second multiplexer/demultiplexer is a 1×N waveguide grating router (WGR).

25-27. (Canceled)